

What is claimed is:

1. A transmission mechanism for driving four wheels of an automotive vehicle comprising:

- 5           a drive housing having a first bearing bracket disposed at the middle portion thereof, a second bearing bracket disposed at the middle portion thereof, a third bearing bracket disposed at the left upper portion thereof, a fourth bearing bracket disposed at the right upper portion thereof, a fifth bearing bracket disposed below the first bearing bracket, and a sixth bearing bracket disposed at the lower portion thereof;
- 10           a differential mechanism including a right side bevel gear, a left side bevel gear, and a ring gear;
- a driving power input shaft mounted within said first bearing bracket;
- a first dual tandem gear slidably mounted on said driving power input shaft;
- a core shaft mounted within said second bearing bracket, on which said differential
- 15   mechanism is mounted;
- a sixth gear connected with said core shaft;
- a seventh gear connected with said core shaft;
- a rear right wheel output shaft mounted within said third bearing bracket;
- an eighth gear fixed to said rear right wheel output shaft;
- 20           a rear left wheel output shaft mounted within said fourth bearing bracket;
- a ninth gear fixed to said rear left wheel output shaft;
- a middle shaft mounted within said fifth bearing bracket;
- a left gear mounted on said middle shaft close to said fifth bearing bracket;

a right gear mounted on said middle shaft to mesh with said ring gear;  
a middle gear mounted on said middle shaft between said left and said right gear;  
a front right wheel output shaft mounted within said sixth bearing bracket;  
a clutch gear mounted on said front right wheel output shaft;

5 a tenth gear mounted on said front right wheel output shaft; and

a front left wheel output shaft connected with said tenth gear, into which said front right wheel output shaft is extended,

wherein when said driving power input shaft is driven, said first dual tandem gear can be regulated to mesh with either said left gear or said middle gear so that the automotive vehicle can  
10 obtain different speeds, and wheels at the same side of the automotive vehicle can be driven at the same time.

2. The transmission mechanism of claim 1, wherein said tenth gear is fixed to a shaft sleeve that is mounted on said front right wheel output shaft, and a slidable engaging member is provided to connect said front left wheel output shaft with said shaft sleeve.

15 3. The transmission mechanism of claim 1, wherein a fork sleeve is slidably mounted on said front right wheel output shaft and provides an inner gear to mesh with said clutch gear.

4. The transmission mechanism of claim 2, wherein a fork sleeve is slidably mounted on said front right wheel output shaft and provides an inner gear to mesh with said clutch gear.

20 5. The transmission mechanism of claim 1, wherein said ring gear is fixed to a first shaft sleeve extended from said differential case, and said seventh gear is splined to a second shaft sleeve extended from said right side bevel gear.

6. The transmission mechanism of claim 2, wherein said ring gear is fixed to a first shaft sleeve extended from said differential case, and said seventh gear is splined to a second shaft sleeve extended from said right side bevel gear.

7. The transmission mechanism of claim 3, wherein said ring gear is fixed to a first shaft sleeve extended from said differential case, and said seventh gear is splined to a second shaft sleeve extended from said right side bevel gear.

8. The transmission mechanism of claim 4, wherein said ring gear is fixed to a first shaft sleeve extended from said differential case, and said seventh gear is splined to a second shaft sleeve extended from said right side bevel gear.

9. The transmission mechanism of claim 1, wherein said first dual tandem gear is splined to said driving power input shaft.

10. The transmission mechanism of claim 2, wherein said first dual tandem gear is splined to said driving power input shaft.

11. The transmission mechanism of claim 3, wherein said first dual tandem gear is splined to said driving power input shaft.

12. The transmission mechanism of claim 4, wherein said first dual tandem gear is splined to said driving power input shaft.

13. The transmission mechanism of claim 5, wherein said first dual tandem gear is splined to said driving power input shaft.

14. The transmission mechanism of claim 2, wherein each of said first dual tandem gear and said slidable engaging member provides a recess at the outer surface thereof for connecting a fork.

15. The transmission mechanism of claim 4, wherein each of said first dual tandem gear and said slidable engaging member provides a recess at the outer surface thereof for connecting a fork.

16. The transmission mechanism of claim 6, wherein each of said first dual tandem gear and said slidable engaging member provides a recess at the outer surface thereof for connecting a fork.

17. The transmission mechanism of claim 10, wherein each of said first dual tandem gear and said slidable engaging member provides a recess at the outer surface thereof for connecting a fork.